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Frequency shift of Raman modes due to an applied electric field and domain inversion in LiNbO₃ GREG STONE, BRIAN KNORR, Lehigh University, VENKATRAMAN GOPALAN, Pennsylvania State University, VOLKMAR DIEROLF, Lehigh University — We report changes in the frequency of several Raman modes in congruent and near-stoichiometric lithium niobate that are observed under the application of external applied electric fields parallel to the ferroelectric axis and after domain inversion. A comparison of the direction of the frequency shifts due to an applied electric field and domain inversion reveals that after forward poling there is a reduction of the internal field that is dependent on the intrinsic defect concentration present in the crystal. Upon back poling, the internal field returns to its original state. A further inspection of the Raman peaks reveals that the magnitude of the frequency shift is not consistent between an applied electric field and domain inversion. This indicates that the change in the local internal field introduced by domain inversion is not limited to the ferroelectric axis, but the fields orthogonal to the ferroelectric axis change. Work supported by the grants: NSF-DMR 0602986 and 1008075

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